AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An optical regenerator including:

(a) a data division stage ~~(1)~~ arranged to receive an incoming optical data stream having a bit rate and to divide the incoming optical data stream into a plurality of further optical data streams each having a lower bit rate than the bit rate of the incoming data stream; and

(b) a regeneration stage ~~(2)~~, including a plurality of optical gate means ~~(9,10)~~each arranged to receive a respective one of the further data streams at its control input and to receive at another input an optical clock stream at the frequency of the bit rate of the further data streams or a multiple thereof, wherein the outputs of the gate means are connected in common to an optical output ~~(5)~~of the regenerator and arranged to provide a bit-interleaved regenerated optical data stream at the said output ~~(5)~~.

2. (Currently Amended) A regenerator according to claim 1, in which the data division stage ~~(2)~~includes a plurality of optical gate means ~~(9,10)~~each arranged to receive the incoming data stream at a respective data input and to receive at a respective control input an optical clock stream at the frequency of the bit rate of the further ~~signals,~~data streams and delay means arranged to impose a different respective delay ~~(11)~~on ~~the~~said optical clock stream relative to the incoming data signal for each of the respective gate means.

3. (Currently Amended) A regenerator according to claim 1, in which the regenerator is arranged to regenerate a received bit-asynchronous optical packet, and in which each of the gate means ~~(9,10)~~of the regeneration stage includes an array of optical gates ~~(31-34)~~, means for imposing different respective delays between the clock signal and the data signal at each of the gates making up the array and switch means for selecting an optical output from one of the gates in the array depending on the bit-level phase of the received optical packet.

4. (Currently Amended) A method of regenerating an optical data signal including ~~the steps of:~~

(a) dividing an incoming optical data signal at a bit rate into a plurality of further data optical streams each having a lower bit rate than the bit rate of the incoming optical signal;

(b) gating under the control of the plurality of further data streams a clock signal at the frequency of the bit rate of the further ~~signals~~data streams or a multiple thereof; and

(c) interleaving the optical signals produced by step (b) thereby creating a re-generated optical signal at the bit rate of the received optical data signal.

5. (Currently Amended) A method according to claim 4, in which the step of dividing the optical data signal includes applying the incoming optical data signal to a respective input of each of a plurality of gate means, applying to a respective control input of each of the plurality of gate means an optical clock stream at the frequency of the bit rate of the further ~~signals~~data streams or a multiple thereof, and imposing a different respective delay relative to the higher bit rate data signal on each of the said optical clock streams.

6. (Currently Amended) A method according to claim 4, in which the step of gating the clock signal includes applying each of the said data streams to an array of optical gates ~~(31-34)~~, imposing different respective delays between the clock signal and the data signal at each of the gates making up an array, and selecting an optical output from one of the plurality of gates in each array depending on the bit level phase of a received bit-asynchronous optical data signal.

7. (Previously Presented) A node for connection in an optical network and including a regenerator according to claim 1.

8. (Previously Presented) An optical network including a regenerator according to claim 1.

9. (New) A node as in claim 7, further including an add/drop function for local traffic of the network.

10. (New) An optical network including a node according to claim 7.

11. (New) A regenerator arranged to implement a method of regenerating an optical data signal according to claim 4, the regenerator including:

(a) means to divide an incoming optical data signal at a bit rate into a plurality of further data streams each having a lower bit rate than the bit rate of the incoming optical signal;

(b) means to gate under the control of the plurality of further data streams a clock signal at the frequency of the lower bit rate or a multiple thereof; and

(c) means to interleave the optical signals produced by means (b) thereby creating a re-generated optical signal at the bit rate of the incoming optical data signal.

12. (New) A regenerator as in claim 1, in which the incoming optical data stream has a bit rate of 160 $Gbits^{-1}$.

13. (New) A method as in claim 4, in which the incoming optical data stream has a bit rate of 160 $Gbits^{-1}$.

14. (New) A node as in claim 17 in which the incoming optical data steram has a bit rate of 160 $Gbits^{-1}$.

15. (New) A network as in claim 10 in which the incoming optical data steam has a bit rate of 160 $Gbits^{-1}$.